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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/781,570

02/18/2004

Giovanni Cesura

02-CA-467/GC

9296

23334

7590

05/12/2005

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EXAMINER

WAMSLEY, PATRICK G

ART UNIT

PAPER NUMBER

2819

DATE MAILED: 05/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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| | | | |
|------------------------------|--------------------------------|------------------------------|--|
| Office Action Summary | Application No. 10/781,570 | Applicant(s) CESURA ET AL | |
| | Examiner Patrick G. Wamsley | Art Unit 2819 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10 and 14 is/are rejected.
- 7) ☒ Claim(s) 7-9, 11-13 and 15-20 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>02/18/2004</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

Figure 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. The flash ADC [115], marked as "Prior Art" in Figure 1, is also illustrated in this drawing. See MPEP § 608.02(g).

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the plurality of comparators must be shown or canceled from claims 2 and 4. See lines 2-3 of Page 14. No new matter should be entered.

The drawings are objected to because of the following informality:

Figure 3, Block 310: Change "Sinc" to -- Sync --.

Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities:

Page 6, line 25: Change "continuos" to -- continuous --.

Page 12, line 6: Change "sinc" to -- sync --.

Page 12, line 7: Change "sinc" to -- sync --.

Page 13, line 1: Change "sinc" to -- sync --.

Page 13, line 4: Change "sinc" to -- sync --.

Appropriate correction is required.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6, 10, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Admitted Prior Art, hereafter APA, in view of U.S. Patent 4,251,803 to Debord et al, hereafter Debord.

For claim 1, APA, as depicted in Figure 1, discloses an analog-to-digital converter, hereafter ADC [100], comprising at least one stage [105] for converting an analog input signal $[X(z)]$ into a digital output signal $[U(z)]$ using a parallel quantizer [115] comparing the analog input signal $[X(z)]$ with a plurality of threshold values in parallel [Page 2, lines 3-4].

Unlike claim 1, APA lacks means for estimating an analog correction signal. In contrast, Debord provides a dynamic zero offset compensating circuit for an ADC. Specifically, Debord provides means [10: Fig. 1] to correct a zero offset, corresponding

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to the recited quantization error. Debord's correction signal is functionally equivalent to the recited analog correction signal. At the time of the invention, it would have been obvious to one of ordinary skill in the art to have applied Debord's compensation teachings to APA's ADC. The motivation would have been to compensate for offset errors, as suggested by Debord, [col. 2, lines 13-16].

For claims 2 and 4, APA discloses a parallel quantizer [115] comprising a plurality of comparators [410] and at least one capacitor [430]. In the APA / Debord combination, Debord's compensation signal would charge APA's capacitor.

For claim 3, APA discloses a plurality of stages [105 / 110], including at least one stage [105] and at least one further stage [110], the plurality of stages [105 / 110] being cascade connected [Page 8, line 23] in a sequence, wherein each stage different from a last stage in the sequence [110] includes means [120 / 140] for determining an analog residue indicative of the corresponding quantization error and means [145] for generating the analog input signal for a next stage in the sequence according to the analog residue.

For claim 5, the input [11] to Debord's offset correction circuit [10] is a digital signal, while the offset compensation signal [node M] is an analog signal. Therefore, Debord's circuit converts a digital correction signal into an analog correction signal.

For claims 6 and 14, APA discloses that each stage [147] following the selected stage [105] has a resolution lower than the resolution of the selected stage [105].

For claim 10, APA discloses means [148] for combining the digital output signals of a plurality of stages [147] into a digital residue signal.

Allowable Subject Matter


Claims 7-9, 11-13, and 15-20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the references of record neither reveal nor render obvious the recited combination including the concepts of reducing the resolution of a digital correction signal [claims 7, 11, and 17], setting the dynamic range of an analog correction signal relative to the quantization error range [claims 8, 12, 15, and 19], and using the combination of a digital filter and an integrator to calculate a digital correction signal on the basis of a digital residue [claims 9, 13, 16, 18, and 20].

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,323,791 to Murden et al reduces residue signal offset in subranging ADCs. U.S. Patent 6,111,529 to Maulik et al cancels offset errors during ADC gain calibration. U.S. Patent 5,594,445 to Ginetti compensates for offset in an operational amplifier [50] in an ADC stage. EP 1,450,490 to Cesura et al is related to the instant invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick G. Wamsley whose telephone number is (571) 272-1814. The official facsimile number is (703) 872-9306. An alternate facsimile number, (571) 273-1814, should only be used for unofficial documents.


Patrick G. Wamsley

May 10, 2005